WHAT IS CLAIMED IS:

1. An optical processing device, comprising:

a polarization modulator operable to change a polarization state of an input optical signal based at least in part on a control voltage applied to a liquid crystal material associated with the polarization modulator;

wherein the control voltage is based at least in part on a temperature of the liquid crystal material.

2. The device of Claim 1, wherein the liquid crystal material comprises a birefringence of 0.21 or less and wherein the device is capable of switching at speeds of 50 milliseconds or less.

3. The device of Claim 1, wherein the liquid crystal material comprises a birefringence of 0.17 or less and wherein the device is capable of switching at speeds of 50 milliseconds or less.

4. The device of Claim 1, wherein the liquid crystal material comprises a phase range of at least 120 degrees Celsius;

wherein the phase range includes at least a temperature range of -15 degrees Celsius to 80 degrees Celsius; and

wherein the device is capable of switching at speeds of 50 milliseconds or less.

5. The device of Claim 1, wherein the liquid crystal material comprises a birefringence of 0.21 or less and a phase range of at least -20 to 100 degrees Celsius.

6. The device of Claim 1, wherein the liquid crystal material comprises a birefringence of 0.17 or less and a phase range of at least -20 to 120 degrees Celsius.

7. The device of Claim 1, wherein the device exhibits no more than a 0.2 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

8. The device of Claim 1, wherein the device exhibits no more than a 0.1 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

9. The device of Claim 1, wherein the device exhibits no more than a 0.03 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

10. The device of Claim 1, wherein the liquid crystal material comprises a material selected from the group consisting of MLC-6647, ZOC-9011-100LA, and MLC-6621.

11. The device of Claim 1, wherein the polarization state change of the input optical signal causes a change in an intensity of an optical signal output from the device.

12. The device of Claim 1, further comprising a controller operable to determine the control voltage applied to the liquid crystal material based at least in part on the temperature of the liquid crystal material.

13. The device of Claim 13, wherein the controller receives from the liquid crystal material a feedback signal that indicates the temperature of the liquid crystal material.

14. The device of Claim 13, wherein:

the controller determines the control voltage based at least in part upon the feedback signal and data stored in memory; and

the data stored in memory relates an operational characteristic of the polarization modulator with the temperature of the liquid crystal material and with a magnitude of the control voltage.

15. The device of Claim 14, wherein the operational characteristic comprises an attenuation level for the input optical signal.

16. The device of Claim 1, further comprising a first beam displacer operable to spatially separate the input optical signal into a pair of at least approximately orthogonally polarized beam components, wherein the polarization modulator is further operable to change the polarization state of the beam components based at least in part upon the control signal.

17. The device of Claim 16, further comprising a second beam displacer operable to spatially combine at least a portion of the beam components communicated by the polarization modulator to form an output optical signal.

18. The device of Claim 17, wherein at least one of the first beam displacer and the second beam displacer comprises a birefringement element.

19. A method of processing an optical signal using an optical processing device, comprising:

receiving a feedback signal indicating a temperature of a liquid crystal material associated with the optical processing device;

determining a control signal based at least in part on the feedback signal; and

adjusting a polarization state of an input optical signal using the optical processing device in response to the control signal.

20. The method of Claim 19, wherein the polarization state change of the input optical signal causes a change in an intensity of an optical signal output from the device.

21. The method of Claim 19, wherein the operational characteristic comprises a desired attenuation level of an optical signal communicated from the optical processing device.

22. The method of Claim 19, further comprising:

storing information relating an operational characteristic of the optical processing device with the temperature of the liquid crystal material and with a magnitude of the control signal.

23. The method of Claim 22, wherein determining the control signal is further based on the stored information.

24. An optical processing device for use at wavelengths between approximately 1310 and 1610 nanometers, comprising:

an optical switching element comprising a liquid crystal material comprising:

a birefringence of 0.21 or less; and

a phase range of at least 120 degrees Celsius;

wherein the phase range includes at least a temperature range of -15 degrees Celsius to 80 degrees Celsius.

25. The device of Claim 24, wherein the optical switching element is capable of processing wavelengths between approximately 1490 and 1610 nanometers.

26. The device of Claim 24, wherein the liquid crystal material comprises:

a birefringence of 0.17 or less; and

a phase range of at least -20 to 120 degrees Celsius.

27. The device of Claim 24, wherein the optical switching element comprises a polarization modulator operable to effect a change in a polarization state of an input optical signal based at least in part on a control voltage applied to the liquid crystal material

28. The device of Claim 27, wherein the polarization modulator comprises:

a plurality of electrode layers operable to apply an electric field to the liquid crystal material;

a plurality of substantially transparent substrates each coupled to at least one of the plurality of electrode layers; and

a plurality of alignment layers operable to align the liquid crystal material to the electrode layer.

29. The device of Claim 24, wherein the device exhibits no more than a 0.2 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

30. The device of Claim 24, wherein the device exhibits no more than a 0.1 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

31. The device of Claim 24, wherein the device exhibits no more than a 0.03 decibel change in attenuation for each degree of Celsius change in temperature of the liquid crystal material.

32. The device of Claim 24, wherein the liquid crystal material comprises a material selected from the group consisting of MLC-6647, ZOC-9011-100LA, and MLC-6621.

33. The device of Claim 24, wherein the device is capable of switching speeds of 50 milliseconds or less.

34. The system of Claim 24, further comprising a controller operable to determine a control voltage applied to the liquid crystal material based at least in part on a temperature of the liquid crystal material.